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## Fats, Cholesterol, and Sodium Intake in the Diet of Persons 1-74 Years: United States<sup>a</sup>

### INTRODUCTION

Several dietary components of the current diet in the United States may be risk factors in the development of major diseases, particularly cardiovascular diseases and cancer.<sup>1-12</sup> Because of the importance of the reported relationship between dietary components and disease patterns, this report provides reference data on the consumption patterns and food groups that are the major sources of these components.

The dietary data were obtained during the first Health and Nutrition Examination Survey (HANES I). The survey is a program in which measures of nutrition status are collected for a scientifically designed sample representative of the civilian noninstitutionalized population of the United States in a broad range of ages.

Of the 28,043 sample persons selected to represent 194 million persons aged 1-74 years in the U.S. population, 20,749 persons, or 74 percent, were examined. This is an effective response rate of 75 percent when adjustment is made for the effect of oversampling among preschool children, women of childbearing age, the poor, and the elderly.

The HANES nutrition examination component included a general medical examination by a physician for indicators of nutritional deficiencies, a skin examination by a dermatologist, and a dental examination by a dentist. Body measurements were taken by a trained technician; a dietary interview, consisting of a 24-hour recall of food consumption and a food frequency questionnaire, was administered by

professional dietary staff; and numerous laboratory tests were performed on whole blood, serum, plasma, and urine. A description of the sampling process, HANES operations, and response rates has been published.<sup>13</sup>

Estimates in this report were based on weighted observations, i.e., data obtained on examined persons are inflated to the level of the total population using appropriate weights to account for both sampling fractions and response results.

Findings on the consumption patterns and sources of food groups from dietary components will be analyzed and discussed in a future report.<sup>14</sup> Selected data from that report are presented in tables 1-8 and figure 1.

Information on food intake was obtained by the 24-hour recall method for the day, midnight to midnight, preceding the interview and accounted for all regular meals eaten as well as for between-meal foods or snacks. Food recall included foods eaten on Monday through Friday but generally excluded foods eaten on weekends which may pertain to unusual food intakes.

Foods reported by individuals were grouped under 18 main headings (figure 1). Eleven of these food groups were major sources of the nutrients, cholesterol, and sodium intake and are shown in tables 1-7. These 11 food groups and the other 7—sources of only small proportions of nutrients, cholesterol, and sodium—are shown in table 8. Contents of food groups 1-18 referred to in this report are presented in figure 1.

### FAT INTAKE

HANES provided data on dietary intake of total fat and saturated fat. The data did not permit evaluation of total polyunsaturated and

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**Figure 1. FOOD OR FOOD GROUPS CONTRIBUTING TO FAT, CHOLESTEROL, AND SODIUM INTAKES**

| FOOD OR FOOD GROUP  | EXPLANATION OF FOOD ITEMS   |
|---|---|
| 1 Milk and milk products. . . . .   | Includes milk drunk as a beverage or used on cereals; flavored milk drinks; cocoa made with milk; skim milk, yogurt, or buttermilk; ice milk; ice cream or puddings made with milk; cheese and cheese dishes. EXCEPTION: CREAM CHEESE |
| 2 Meat . . . . .  | Includes beef, pork, lamb, veal, luncheon meats, canned meats, frankfurters   |
| Organ meats . . . . .   | Includes liver, kidney, heart, spleen, etc.   |
| 3 Fats and oils . . . . .   | Includes butter, margarine, salad oils, salad dressings, bacon, cream cheese, cream, peanut butter, non-dairy cream   |
| 4 Desserts and sweets . . . . .   | Includes cake, pie, cookies, fruit puddings, Jello, doughnuts (cake-type and yeast-type), sherbert, sweet snacks. EXCEPTIONS: ICE CREAM, ICE MILK   |
| 5 Mixed protein dishes with carbohydrates-starches or vegetables. . . . . | Includes casseroles, pot pies, pizza, spaghetti with meat, etc. EXCEPTIONS: PLAIN CHEESE DISHES   |
| 6 Cereals . . . . .   | Includes breakfast cereals either dry such as cornflakes or cooked such as oatmeal.   |
| 7 Poultry . . . . .   | Includes chicken, turkey, duck, game birds, cornish hen, etc.   |
| 8 Fish or shellfish . . . . .   | Includes all varieties of fish and shellfish regardless of whether canned, fresh, frozen, dried or salted.  |
| 9 Eggs. . . . .   | Includes eggs eaten e.g., fried, boiled, poached, deviled, or egg salad. EXCEPTIONS: EGGS IN COOKED OR BAKED DISHES SUCH AS CUSTARDS, AND PUDDINGS  |
| 10 Fruits and vegetables . . . . .  | Includes: a. All kinds: fresh, canned, frozen, cooked or raw; juices, including Tang or fruit drinks<br>b. Fruits and vegetables rich in Vitamin A<br>c. Fruits and vegetables rich in Vitamin C                                      |
| 11 Salty snacks . . . . .   | Includes potato chips, corn chips, puffed snacks, cheese snacks, salted popcorn, salted pretzels, etc.  |
| 12 Grain products . . . . .   | Includes bread, rolls, biscuits, muffins, cornbread, crackers, unsalted pretzels.   |
| 13 Alcoholic beverages . . . . .  | Includes a) beer, b) wine, c) distilled liquors   |
| 14 Sugar free and low calorie beverages . . . . .                         | Includes coffee (regular, Sanka and decaffeinated), tea, bouillion, consommé and diet carbonated drinks   |
| 15 Soups. . . . .   | Includes milk and water-based; gravies and sauces (meat and vegetable based)  |
| 16 Legumes and nuts. . . . .  | Includes dry beans and peas such as pinto beans, red beans, black-eyed peas, peanuts, soybeans, soy products, etc.  |
| 17 Miscellaneous . . . . .  | Includes mustard, gelatin, malt, beverage powders, chili powders, seeds, low fat salad dressings, etc.  |
| 18 Sugar and primarily sugar products . . . . .                           | Includes candy, Kool-aid, soft drinks, lemonade, limeade.   |

monounsaturated fatty acids, but intake data were available for linoleic and oleic fatty acids.

The quality and kind of fat in the diet affects the serum lipid concentration. Saturated fat tends to elevate and polyunsaturated tends to decrease the serum cholesterol levels. Polyunsaturated fatty acids considered essential for nutrition are linoleic, linolenic, and arachidonic. Of the three, linoleic is relatively more abundant in foods than the other two. Monounsaturated fat, of which oleic acid is the most common fatty acid, does not elevate or lower the serum lipids.

Findings from HANES showed that the average reported consumption of fat was 83 grams on the day of recall. Fat represented 38 percent of the calories consumed daily (table 1). Males reported a higher fat intake, a mean of 100 grams per day, than females (67 grams) did. However, the percent of calories from fat was the same for both sexes (38 percent).

The daily mean fat intake of females increased with age from 60 grams at the youngest age group (1-5 years) to a maximum of 79 grams at the older age group (12-17 years) and then declined in each successively older age group (table 1).

A similar pattern was found for males. However, the mean fat intake was higher in each age group than that for females (an expected occurrence since the reported food intakes of males provided more calories than the diets of females did), and peaked at a later age group (18-44 years).

The major sources of fat in the diet for both males and females aged 1-74 years, in descending order of their percent contribution, were meat, milk and milk products, fats and oils, desserts and sweets, and grain products. These five food groups provided more than 70 percent of the fat for each sex and age group in the population (table 2).

### Meat

The meat group includes beef, pork, lamb, veal, luncheon meats, canned meats, frankfurters, and organ meats. For both males and females the percent contribution of meat to the fat value of the diet increased with age from the youngest ages (1-5 years), peaked at the adult ages (18-44 years), and then declined slightly. Adult males consumed larger percents of fat from meat than adult females did. The observed difference in percents between males and females in the youngest ages was slight.

### Milk and Milk Products

The milk and milk products group includes whole milk, skim milk, or buttermilk reported as a beverage or used on cereal, flavored milk drinks, cocoa made with milk, yogurt, ice milk, ice cream, puddings made with milk, and cheese and cheese dishes. Foods from this group supplied more of the fat in the diets of children 1-11 years of age than any other food group did, accounting for roughly 30 percent of the total fat

Table 1. Mean daily fat intake and percent of calories provided by fat, by sex and age: United States, 1971-74

| Age              | Both sexes             |                              | Male                   |                              | Female                 |                              |
|------------------|------------------------|------------------------------|------------------------|------------------------------|------------------------|------------------------------|
|                  | Mean fat intake (gram) | Percent of calories from fat | Mean fat intake (gram) | Percent of calories from fat | Mean fat intake (gram) | Percent of calories from fat |
| 1-74 years.....  | 83                     | 38                           | 100                    | 38                           | 67                     | 38                           |
| 1-5 years.....   | 63                     | 37                           | 66                     | 37                           | 60                     | 37                           |
| 6-11 years.....  | 84                     | 37                           | 90                     | 38                           | 78                     | 37                           |
| 12-17 years..... | 96                     | 38                           | 113                    | 38                           | 79                     | 39                           |
| 18-44 years..... | 91                     | 38                           | 115                    | 38                           | 69                     | 38                           |
| 45-64 years..... | 76                     | 38                           | 94                     | 39                           | 60                     | 37                           |
| 65-74 years..... | 62                     | 37                           | 75                     | 38                           | 52                     | 36                           |

Table 2. Mean daily fat intake and percent of fat provided by selected major food groups, by sex and age: United States, 1971-74

| Sex and age      | Mean fat intake (gram) | Selected food groups |                        |               |                     |                |       |
|------------------|------------------------|----------------------|------------------------|---------------|---------------------|----------------|-------|
|                  |                        | Meat                 | Milk and milk products | Fats and oils | Desserts and sweets | Grain products | Other |
| <u>Male</u>      |                        | Percent              |                        |               |                     |                |       |
| 1-74 years.....  | 100                    | 24                   | 19                     | 15            | 8                   | 7              | 27    |
| 1-5 years.....   | 66                     | 15                   | 30                     | 14            | 9                   | 7              | 25    |
| 6-11 years.....  | 90                     | 17                   | 28                     | 13            | 9                   | 7              | 26    |
| 12-17 years..... | 113                    | 21                   | 25                     | 12            | 9                   | 7              | 26    |
| 18-44 years..... | 115                    | 28                   | 16                     | 15            | 7                   | 6              | 28    |
| 45-64 years..... | 94                     | 27                   | 14                     | 19            | 7                   | 7              | 26    |
| 65-74 years..... | 75                     | 24                   | 15                     | 20            | 7                   | 7              | 27    |
| <u>Female</u>    |                        |                      |                        |               |                     |                |       |
| 1-74 years.....  | 67                     | 21                   | 20                     | 16            | 8                   | 7              | 28    |
| 1-5 years.....   | 60                     | 16                   | 31                     | 13            | 8                   | 5              | 27    |
| 6-11 years.....  | 78                     | 17                   | 29                     | 13            | 9                   | 7              | 25    |
| 12-17 years..... | 79                     | 21                   | 23                     | 12            | 9                   | 6              | 29    |
| 18-44 years..... | 69                     | 23                   | 16                     | 17            | 8                   | 7              | 29    |
| 45-64 years..... | 60                     | 23                   | 15                     | 19            | 7                   | 7              | 29    |
| 65-74 years..... | 52                     | 20                   | 15                     | 22            | 7                   | 8              | 28    |

consumed by young boys and girls. The percent contribution of milk and milk products to fat intake for males and females declined with age, with the lowest percents falling in the older age groups. This pattern for children was the opposite of that found for the meat group.

### Fats and Oils

The fats and oils group includes butter, margarine, salad oils and dressings, bacon, cream cheese, creamy peanut butter, and nondairy cream. Gravies and low calorie salad dressings are not included. The largest percent contribution of fats and oils to fat intake was at the oldest age group (65-74 years) of males and females where it accounted for 20 and 22 percent, respectively. However, a smaller percent contribution of fats and oils was in the intakes of children and adolescents.

### Desserts, Sweets, and Grain Products

The desserts and sweets and the grain products groups were less important as sources of

fat in the U.S. diet. Desserts and sweets, excluding candy, contributed 7-9 percent of the daily fat intake, with the percent contribution about the same in each age group and for both sexes.

Grain products generally contributed a slightly smaller percent of fat to the diet than the desserts and sweets groups did. By age, values ranged from 6-7 percent for males and 5-8 percent for females.

### Saturated Fat

Table 3 shows that the age patterns described for total fat consumption of males and females were also observed for saturated fat. Table 3 also shows the seven food groups that were the major sources of saturated fat. Altogether, these groups provided 84 percent or more of the saturated fat for each age-sex group. As with total fat intake, the milk and milk products group is the major source of saturated fat for children and adolescents of both sexes. For adults the meat group was the major source.

Table 3. Mean daily saturated fat intake and percent of saturated fat provided by major food groups, by sex and age: United States, 1971-74

| Sex and age      | Mean saturated fat intake (gram) | Source of saturated fat |      |               |                      |                |                     |      |       |
|------------------|----------------------------------|-------------------------|------|---------------|----------------------|----------------|---------------------|------|-------|
|                  |                                  | Milk and milk products  | Meat | Fats and oils | Mixed protein dishes | Grain products | Desserts and sweets | Eggs | Other |
| <u>Male</u>      |                                  | Percent                 |      |               |                      |                |                     |      |       |
| 1-74 years.....  | 37                               | 29                      | 28   | 12            | 5                    | 5              | 5                   | 4    | 12    |
| 1-5 years.....   | 25                               | 44                      | 17   | 10            | 5                    | 5              | 5                   | 4    | 10    |
| 6-11 years.....  | 34                               | 41                      | 19   | 9             | 6                    | 5              | 5                   | 3    | 12    |
| 12-17 years..... | 42                               | 37                      | 24   | 10            | 6                    | 4              | 5                   | 2    | 12    |
| 18-44 years..... | 42                               | 24                      | 33   | 12            | 6                    | 5              | 4                   | 4    | 12    |
| 45-64 years..... | 34                               | 21                      | 31   | 16            | 4                    | 5              | 4                   | 5    | 14    |
| 65-74 years..... | 27                               | 23                      | 27   | 17            | 4                    | 6              | 5                   | 6    | 12    |
| <u>Female</u>    |                                  |                         |      |               |                      |                |                     |      |       |
| 1-74 years.....  | 24                               | 29                      | 25   | 13            | 5                    | 5              | 5                   | 3    | 15    |
| 1-5 years.....   | 23                               | 45                      | 17   | 9             | 5                    | 4              | 5                   | 4    | 11    |
| 6-11 years.....  | 29                               | 42                      | 19   | 10            | 5                    | 5              | 5                   | 2    | 12    |
| 12-17 years..... | 29                               | 34                      | 24   | 9             | 5                    | 5              | 5                   | 2    | 16    |
| 18-44 years..... | 25                               | 24                      | 27   | 14            | 6                    | 5              | 5                   | 3    | 16    |
| 45-64 years..... | 22                               | 23                      | 28   | 17            | 5                    | 5              | 5                   | 4    | 13    |
| 65-74 years..... | 18                               | 24                      | 25   | 18            | 4                    | 6              | 5                   | 5    | 13    |

Other sources of saturated fat (in order of percent contribution to total fat consumption) were fats and oils, mixed protein dishes, grain products, desserts and sweets, and eggs.

Milk and milk products (table 3) supplied 29 percent of the saturated fat in the food intakes of males and females aged 1-74 years. The age patterns found in percent contributions of these foods to total fat intake for males and females were also found for saturated fat. The largest percent was observed in the lowest age group (1-5 years). After these ages the share of saturated fat from the milk group declined with increased age, falling from 41 and 42 percent, respectively, for males and females ages 6-11 years to about 23 percent in the oldest age group (65-74 years) for both sexes.

The meat group (table 3) supplied 28 and 25 percent, respectively, of the saturated fat in the food intakes of males and females aged 1-74 years. The percent contribution increased from the younger ages for both sexes, peaked at ages 18-44 years, and then declined, relatively more

for males than for females. In the younger ages, both sexes showed a relatively larger share of saturated fat from milk and milk products than from meat products. After ages 12-17 years, the share from meat was relatively higher than that from milk and milk products.

The contribution of fats and oils to saturated fat intake ranged from 9 to 17 percent for males; older males reported the largest percent of their saturated fat from fats and oils. A similar pattern was generally observed for females. The contributions of mixed protein dishes, desserts and sweets, grain products, and eggs to this dietary component were relatively smaller. For each food group, the percents by each sex-age group were fairly constant with no observable age pattern.

### Linoleic Acids

Fats and oil products were the major sources of linoleic acids for males and females in all age groups (table 4). The largest percent intake from

Table 4. Mean daily linoleic fatty acid intake and percent of linoleic fatty acids provided by major food groups, by sex and age: United States, 1971-74

| Sex and age      | Mean<br>linoleic<br>fatty acids<br>intake<br>(gram) | Source of linoleic fatty acids |         |                             |                 |      |                           |       |
|------------------|---|--------------------------------|---------|-----------------------------|-----------------|------|---------------------------|-------|
|                  |   | Fats and<br>oils               | Poultry | Fruits<br>and<br>vegetables | Salty<br>snacks | Meat | Desserts<br>and<br>sweets | Other |
| <u>Male</u>      |   | Percent                        |         |                             |                 |      |                           |       |
| 1-74 years.....  | 11  | 36                             | 12      | 11                          | 8               | 8    | 6                         | 19    |
| 1-5 years.....   | 6   | 35                             | 12      | 9                           | 10              | 7    | 7                         | 20    |
| 6-11 years.....  | 9   | 35                             | 11      | 9                           | 13              | 6    | 6                         | 20    |
| 12-17 years..... | 12  | 30                             | 10      | 13                          | 15              | 6    | 6                         | 20    |
| 18-44 years..... | 13  | 35                             | 13      | 11                          | 7               | 9    | 6                         | 19    |
| 45-64 years..... | 10  | 41                             | 14      | 9                           | 2               | 9    | 5                         | 20    |
| 65-74 years..... | 8   | 42                             | 11      | 9                           | 1               | 10   | 6                         | 21    |
| <u>Female</u>    |   |                                |         |                             |                 |      |                           |       |
| 1-74 years.....  | 8   | 36                             | 14      | 10                          | 8               | 7    | 6                         | 19    |
| 1-5 years.....   | 6   | 34                             | 13      | 8                           | 13              | 6    | 6                         | 20    |
| 6-11 years.....  | 8   | 31                             | 14      | 7                           | 16              | 6    | 6                         | 20    |
| 12-17 years..... | 9   | 30                             | 11      | 10                          | 17              | 6    | 6                         | 20    |
| 18-44 years..... | 8   | 36                             | 14      | 11                          | 6               | 7    | 5                         | 21    |
| 45-64 years..... | 7   | 41                             | 14      | 9                           | 3               | 7    | 5                         | 21    |
| 65-74 years..... | 6   | 45                             | 15      | 7                           | 2               | 7    | 5                         | 19    |

this fatty acid occurred after age 44 years—more than 40 percent for both males and females. At the younger ages this food group contributed more than 30 percent of the daily linoleic acid intake.

Broiled, roasted, or stewed poultry usually contributes no more than 1-3 grams of linoleic acid for a 100 gram (3½ ounces) edible serving. In HANES, poultry was the secondary source of this fatty acid. The codes for fried chicken included a standard amount of breading and fat which contributed the linoleic acid to the daily intake. This standard was used only when the actual type and amount of fat used to fry chicken with its skin left on was unknown. Differences in percent contribution of poultry to linoleic acids were small. For males, poultry contributed 10-14 percent of the linoleic acids for all age groups. The corresponding percent for females in comparable age groups was 11-15 percent.

Other major sources of linoleic acids were fruits and vegetables, salty snacks, meat, and desserts and sweets.

Comparing these four food groups, relatively more linoleic acids were obtained from salty snacks for both sexes among children and adolescents than among adults. This age pattern was not evident for the other food products. Generally, the share of linoleic acids from these other food groups remained fairly stable with age.

### Oleic Acids

Meat, milk and milk products, fats and oils, desserts and sweets, grain products, and mixed-protein dishes were the major sources of oleic fatty acids, providing about 80 percent of the oleic acids in the intakes of most sex-by-age groups (table 5).

For the population aged 1-74 years, meat was the major source of oleic acids. The percent contributed by these foods peaked at age 18-44 years for both males and females and then declined slightly.

The share of oleic acids reported from the milk and milk products group was largest among

Table 5. Mean daily oleic fatty acid intake and percent of oleic fatty acids provided by major food groups, by sex and age: United States, 1971-74

| Sex and age      | Mean oleic fatty acids intake (gram) | Source of oleic fatty acids |                        |               |                     |                |                      |       |
|------------------|--------------------------------------|-----------------------------|------------------------|---------------|---------------------|----------------|----------------------|-------|
|                  |                                      | Meat                        | Milk and milk products | Fats and oils | Desserts and sweets | Grain products | Mixed protein dishes | Other |
| <u>Male</u>      |                                      | Percent                     |                        |               |                     |                |                      |       |
| 1-74 years.....  | 37                                   | 27                          | 15                     | 15            | 8                   | 9              | 6                    | 20    |
| 1-5 years.....   | 24                                   | 18                          | 24                     | 16            | 9                   | 8              | 6                    | 19    |
| 6-11 years.....  | 33                                   | 19                          | 23                     | 15            | 10                  | 9              | 7                    | 17    |
| 12-17 years..... | 41                                   | 24                          | 20                     | 13            | 10                  | 9              | 7                    | 17    |
| 18-44 years..... | 43                                   | 31                          | 13                     | 14            | 7                   | 8              | 7                    | 20    |
| 45-64 years..... | 36                                   | 30                          | 11                     | 18            | 7                   | 9              | 4                    | 21    |
| 65-74 years..... | 30                                   | 25                          | 12                     | 20            | 9                   | 9              | 4                    | 21    |
| <u>Female</u>    |                                      |                             |                        |               |                     |                |                      |       |
| 1-74 years.....  | 25                                   | 24                          | 16                     | 16            | 9                   | 9              | 6                    | 20    |
| 1-5 years.....   | 22                                   | 18                          | 25                     | 15            | 9                   | 7              | 6                    | 20    |
| 6-11 years.....  | 28                                   | 20                          | 23                     | 14            | 9                   | 9              | 7                    | 18    |
| 12-17 years..... | 29                                   | 24                          | 19                     | 12            | 10                  | 8              | 6                    | 21    |
| 18-44 years..... | 26                                   | 26                          | 13                     | 16            | 9                   | 9              | 7                    | 20    |
| 45-64 years..... | 23                                   | 25                          | 12                     | 19            | 8                   | 9              | 5                    | 22    |
| 65-74 years..... | 20                                   | 22                          | 12                     | 22            | 9                   | 10             | 4                    | 21    |

children and adolescents, the pattern previously observed for other sources of fat. After age 18 the percent contribution of oleic acids from this food group decreased most rapidly with age, declining to about 12 percent in the older age groups.

The third source of oleic acids, the fats and oils group, contributed 13-20 percent of the oleic acids in the daily intake of males with a slight increase for the oldest age group. A similar narrow range of percent was noted for females of comparable ages, with a slight increase also noted for the oldest age group.

Desserts and sweets and grain products each contributed about the same percent of oleic acids with no noticeable differences between sex and age groups.

### CHOLESTEROL INTAKE

Eggs, meat, and milk and milk products were the major sources of cholesterol, contributing 73 percent of the daily intake of cholesterol for

males and 67 percent for females (table 6). The desserts and sweets group and the fats and oils group each contributed 3-6 percent of the cholesterol for all the sex and age groups.

Eggs were the major source of cholesterol for children aged 1-5 years and for adults of both sexes. Children of these ages and adult males reported more than a third of their cholesterol intake from eggs and adult females slightly less than a third.

Adolescents aged 12-17 years reported relatively more cholesterol intake from the meat food group—more than one-fourth of their daily intake—than the other major food sources.

Milk and milk products were the major sources of cholesterol reported by boys (28 percent) and girls (31 percent) aged 6-11 years.

The percent contribution of eggs to cholesterol intake generally declined with age after ages 1-5 years for both sexes to a low at ages 12-17 years and then increased to about the percent previously observed at the younger age group.

Table 6. Mean daily dietary cholesterol intake and percent of cholesterol provided by major food groups, by sex and age:  
United States, 1971-74

| Sex and age      | Mean<br>cholesterol<br>intake<br>(mg) <sup>1</sup> | Source of cholesterol |      |                              |                           |                  |       |
|------------------|--|-----------------------|------|------------------------------|---------------------------|------------------|-------|
|                  |  | Eggs                  | Meat | Milk and<br>milk<br>products | Desserts<br>and<br>sweets | Fats and<br>oils | Other |
| <u>Male</u>      |  | Percent               |      |                              |                           |                  |       |
| 1-74 years.....  | 439  | 31                    | 26   | 16                           | 4                         | 4                | 19    |
| 1-5 years.....   | 297  | 35                    | 15   | 25                           | 4                         | 3                | 18    |
| 6-11 years.....  | 343  | 25                    | 20   | 28                           | 5                         | 3                | 19    |
| 12-17 years..... | 404  | 21                    | 27   | 26                           | 5                         | 4                | 15    |
| 18-44 years..... | 513  | 32                    | 29   | 13                           | 4                         | 4                | 19    |
| 45-64 years..... | 459  | 35                    | 28   | 11                           | 3                         | 4                | 19    |
| 65-74 years..... | 408  | 36                    | 22   | 10                           | 4                         | 4                | 24    |
| <u>Female</u>    |  |                       |      |                              |                           |                  |       |
| 1-74 years.....  | 298  | 27                    | 24   | 16                           | 5                         | 4                | 24    |
| 1-5 years.....   | 271  | 34                    | 15   | 26                           | 4                         | 3                | 18    |
| 6-11 years.....  | 271  | 19                    | 20   | 31                           | 5                         | 4                | 21    |
| 12-17 years..... | 287  | 22                    | 26   | 23                           | 6                         | 3                | 20    |
| 18-44 years..... | 307  | 27                    | 26   | 13                           | 5                         | 4                | 25    |
| 45-64 years..... | 324  | 28                    | 25   | 11                           | 4                         | 4                | 28    |
| 65-74 years..... | 271  | 31                    | 23   | 12                           | 4                         | 4                | 26    |

<sup>1</sup> Milligram

The largest percent of cholesterol intake from meat occurred at ages 18-44 years for males and at ages 12-17 and 18-44 years for females. The share of cholesterol intake from meat then decreased with age, declining to 22 percent for males and 23 percent for females in the oldest age group. The percent contribution of cholesterol from milk and milk products peaked at ages 6-11 years for both sexes with the foods from this group supplying least of the cholesterol intake in the older age groups (table 6).

The mean cholesterol consumption of males increased from age group 1-5 years, peaked at age group 18-44 years, and then declined. The mean cholesterol consumption of females increased with age, peaked at age group 45-64 years, and then declined; the average cholesterol consumption was the same for the youngest age group (1-11 years) and the oldest age group (65-74 years).

## SODIUM INTAKE

HANES data on sodium intake were converted to salt intake, assuming a ratio of 1 gram of salt to 400 mg. of sodium. The salt data from HANES are incomplete because the values cover only naturally occurring sodium in foods and sodium added by processors. Table salt is not included in these data. Males reported an average daily consumption of 2,663 mg. of sodium or about 7 grams of salt and females reported an average daily consumption of 1,826 mg. of sodium or about 5 grams of salt. Among age groups, the differences in reported percent by source of sodium were small (table 7).

Table 7 also shows the seven food groups that supplied 77 percent or more of sodium for all sex and age groups. Foods such as mustard, ketchup, worcestershire sauce, and other condiments, the major sources of sodium, accounted



Table 7. Mean daily sodium intake and percent of sodium provided by major food groups, by sex and age: United States, 1971-74

| Sex and age      | Mean sodium intake (mg) <sup>1</sup> | Source of sodium |                        |                      |      |       |                       |               |       |
|------------------|--------------------------------------|------------------|------------------------|----------------------|------|-------|-----------------------|---------------|-------|
|                  |                                      | Grain products   | Milk and milk products | Mixed protein dishes | Meat | Soups | Fruits and vegetables | Fats and oils | Other |
| <u>Male</u>      |                                      | Percent          |                        |                      |      |       |                       |               |       |
| 1-74 years.....  | 2,663                                | 24               | 14                     | 12                   | 9    | 8     | 7                     | 6             | 20    |
| 1-5 years.....   | 1,866                                | 21               | 19                     | 11                   | 7    | 9     | 6                     | 6             | 21    |
| 6-11 years.....  | 2,512                                | 23               | 17                     | 13                   | 6    | 7     | 6                     | 5             | 23    |
| 12-17 years..... | 2,924                                | 24               | 16                     | 14                   | 7    | 6     | 6                     | 5             | 22    |
| 18-44 years..... | 2,984                                | 24               | 13                     | 13                   | 9    | 8     | 8                     | 6             | 19    |
| 45-64 years..... | 2,500                                | 26               | 11                     | 8                    | 9    | 9     | 8                     | 8             | 21    |
| 65-74 years..... | 2,212                                | 27               | 11                     | 6                    | 8    | 11    | 8                     | 7             | 22    |
| <u>Female</u>    |                                      |                  |                        |                      |      |       |                       |               |       |
| 1-74 years.....  | 1,826                                | 24               | 14                     | 11                   | 7    | 8     | 8                     | 6             | 22    |
| 1-5 years.....   | 1,703                                | 20               | 19                     | 12                   | 7    | 9     | 6                     | 6             | 21    |
| 6-11 years.....  | 2,214                                | 24               | 17                     | 12                   | 6    | 8     | 7                     | 5             | 21    |
| 12-17 years..... | 1,977                                | 24               | 16                     | 13                   | 7    | 8     | 8                     | 5             | 19    |
| 18-44 years..... | 1,838                                | 24               | 13                     | 13                   | 8    | 9     | 8                     | 7             | 18    |
| 45-64 years..... | 1,674                                | 25               | 12                     | 8                    | 6    | 9     | 10                    | 7             | 23    |
| 65-74 years..... | 1,506                                | 27               | 13                     | 5                    | 8    | 7     | 9                     | 8             | 23    |

<sup>1</sup>Milligram

NOTE: HANES sodium intake values converted to salt intake values assuming a ratio of 1 gram of salt to 400 mg of sodium.

for only 0.2 percent in the 24-hour recall data because of minimal volume consumption. HANES data indicate that grain products are the major contributing source of sodium in the 24-hour recall data. Grain products contributed about one-quarter of the sodium intake in all sex and age subgroups, providing 20-27 percent in all groups. The percents are fairly stable throughout the age groups.

The milk and milk products group was the second major source of sodium intake. Younger males and females showed a higher percent of sodium intake from milk and milk products than adults did. This pattern is expected because of the higher consumption of milk and milk products by the younger age groups.

Mixed protein dishes were another source of sodium. This group of foods contributed 6-14

percent of the daily sodium intake for males and 5-13 percent for females. Both sexes aged 45 years and older showed the smallest share of sodium from this food group.

Other food groups contributing smaller amounts of sodium in the diets of the U.S. population were meats, soups, fruits and vegetables, and fats and oils. These food groups generally contributed less sodium to the daily intake in all population subgroups than grain products, milk and milk products, and mixed protein dishes did. The differences between sexes in percent of sodium intake were small. For each sex, age was not a factor. The percent of dietary components provided by all food groups appearing in the 24-hour recall of all persons aged 1-74 years in the United States is presented in table 8.

Table 8. Percent distribution of dietary components provided by food groups appearing in the 24-hour recall of food consumption and mean intake of dietary components of persons aged 1-74 years: United States, 1971-74

| Food or food group                              | Calories | Protein<br>(gram) | Fat<br>(gram) | Sodium<br>(mg) <sup>1</sup> | Saturated<br>fatty acid<br>(gram) | Oleic acid<br>(gram) | Linoleic<br>acid<br>(gram) | Cholesterol<br>(mg) <sup>1</sup> |
|---|----------|-------------------|---------------|-----------------------------|-----------------------------------|----------------------|----------------------------|----------------------------------|
| Percent distribution                            |          |                   |               |                             |                                   |                      |                            |                                  |
| Total.....                                      | 100.0    | 100.0             | 100.0         | 100.0                       | 100.0                             | 100.0                | 100.0                      | 100.0                            |
| Skim milk or buttermilk...                      | 1.2      | 2.6               | 0.4           | 1.3                         | 0.1                               | 0.1                  | -                          | 0.2                              |
| Cheese and cheese<br>products.....              | 1.9      | 3.6               | 3.4           | 4.2                         | 4.9                               | 2.9                  | 0.9                        | 2.4                              |
| Milk and milk products<br>excluding cheese..... | 12.9     | 16.2              | 15.6          | 8.3                         | 23.9                              | 12.5                 | -                          | 13.7                             |
| Meat.....                                       | 13.6     | 29.6              | 22.5          | 7.9                         | 26.5                              | 25.5                 | 7.1                        | 23.2                             |
| Poultry.....                                    | 1.5      | 5.1               | 3.7           | 0.2                         | 2.0                               | 3.3                  | 12.9                       | 2.9                              |
| Organ meats.....                                | 0.2      | 0.6               | 0.3           | 0.1                         | 0.3                               | 0.4                  | 0.2                        | 1.9                              |
| Fish or shellfish.....                          | 1.3      | 4.0               | 1.4           | 0.7                         | 1.0                               | 1.3                  | 2.0                        | 2.9                              |
| Eggs.....                                       | 2.2      | 3.6               | 3.9           | 2.9                         | 3.6                               | 4.2                  | 2.4                        | 29.1                             |
| Soups.....                                      | 1.4      | 0.9               | 1.8           | 8.1                         | 1.7                               | 1.7                  | 2.4                        | 0.5                              |
| Fats and oils.....                              | 6.3      | 2.0               | 15.4          | 6.3                         | 12.4                              | 15.4                 | 35.8                       | 3.7                              |
| Legumes and nuts.....                           | 2.2      | 3.0               | 2.2           | 4.0                         | 1.7                               | 2.3                  | 2.5                        | 5.9                              |
| Cereals.....                                    | 1.8      | 1.2               | 0.4           | 3.4                         | 0.1                               | 0.1                  | 0.4                        | -                                |
| Grain products.....                             | 15.1     | 11.2              | 6.6           | 24.0                        | 4.9                               | 8.6                  | 5.0                        | 3.7                              |
| Fruits and vegetables.....                      | 10.8     | 5.2               | 5.1           | 7.7                         | 3.3                               | 3.5                  | 10.2                       | 1.1                              |
| Sugar and primarily<br>sugar products.....      | 8.8      | 0.7               | 1.8           | 0.5                         | 1.9                               | 2.2                  | 1.5                        | 0.1                              |
| Desserts and sweets.....                        | 8.0      | 2.7               | 7.7           | 6.1                         | 4.7                               | 8.4                  | 5.6                        | 4.2                              |
| Miscellaneous.....                              | 0.5      | 0.4               | 0.3           | 0.2                         | 0.1                               | 0.1                  | 1.1                        | -                                |
| Mixed protein dishes.....                       | 4.9      | 6.5               | 5.1           | 11.5                        | 5.2                               | 6.1                  | 1.8                        | 4.3                              |
| Alcoholic beverages.....                        | 3.3      | 0.4               | -             | 0.3                         | -                                 | -                    | -                          | -                                |
| Sugar free and low<br>calorie beverages.....    | 0.4      | 0.1               | -             | 0.6                         | -                                 | -                    | -                          | 0.1                              |
| Salty snacks.....                               | 1.5      | 0.5               | 2.2           | 1.5                         | 1.6                               | 1.4                  | 8.2                        | -                                |
| Mean.....                                       | 1,971    | 77                | 83            | 2,230                       | 30                                | 31                   | 9                          | 366                              |

<sup>1</sup>Milligram

## DISCUSSION

Reference data on dietary components implicated in increased risk to disease have been presented and analyzed by sex and age because of the medical interest in such data. These estimates are generalized for the U.S. population and provide cross-sectional data on the consumption of selected dietary components as reported by persons representing different age groups in the U.S. population. The limitations of cross-sectional data should be recognized in considering age group changes. The use of 24-hour recall to estimate dietary habits is also a limitation. Recent food intakes do not necessarily reflect lifetime dietary habits. Since the disease

processes of those cited are long-term, it is questionable to relate recent dietary habits to the risk of these diseases. The estimates in this report will be compared with HANES II data on food consumption patterns which will be available in 1980.

There are limitations to the dietary estimates obtained from HANES. The major source of data for the basic nutritional values of food items is from the U.S. Department of Agriculture Handbook No. 8.<sup>15</sup> Because of the introduction of new food items in the market, updated and added values for new foods are made according to information provided by the U.S. Department of Agriculture (USDA), food processors, and manufacturers. However, despite

the considerable data on the nutrient composition of foods, information is less than optimal in those areas of the macronutrients whose importance is of immediate interest.

More of the data used in HANES, obtained from the USDA data bank, are for commodities than for brand name convenience foods.

Another problem is lack of information on

the lipid content of food served by institutions, restaurants, and fast food outlets;<sup>16</sup> the main sources of compiled data have covered only food eaten in the home. The present dietary data bank was compiled mainly for nutrients—e.g. vitamins A and C, calcium, and iron—whose deficiency led to the classical nutritional diseases.

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### SYMBOLS

|   |     |
|---|-----|
| Data not available.....   | --- |
| Category not applicable.....                                    | ... |
| Quantity zero.....  | -   |
| Quantity more than 0 but less than 0.05.....                    | 0.0 |
| Figure does not meet standards of reliability or precision..... | *   |

## TECHNICAL NOTES

The sampling plan for the 65 examination locations in the Health and Nutrition Examination Survey (HANES) followed a highly stratified multistage probability design in which a sample of the civilian noninstitutionalized population of the conterminous United States aged 1-74 years was selected. Successive elements used in the sampling process were the primary sampling unit, census enumeration district, segment (a cluster of households), household, eligible person, and sample person. The sampling design provided for oversampling among persons living in poverty areas, preschool children, women of childbearing age, and the elderly.

The dietary component values are shown as population estimates, i.e. the findings for each individual have been "weighted" by the reciprocal of the probability of selecting the person. An adjustment for persons in the sample who were not examined and post-stratified ratio adjustments were also made so that the final sampling estimates of the population size are brought into closer alignment with the independent U.S. Bureau of the Census estimates for the civilian noninstitutionalized population of the United States as of November 1, 1972, by race, sex, and age.

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